

Centerpulse Orthopedics Ltd.

**Claims**

- 5     1.     An implant for the treatment of bone fractures, in particular of  
proximal humerus fractures, having a main plate (13) fixable to the  
bone (11) and at least one outrigger (15) which can be connected to  
the main plate (13) via at least one flexible connection element (17)  
such that the outrigger (15) can be fixed to the bone (11) spatially  
10     offset to the main plate (13).
2.     An implant in accordance with claim 1, characterised in that the  
outrigger (15) is made in plate shape.
- 15     3.     An implant in accordance with claim 1 or claim 2, characterised in  
that the outrigger (15) is made flexible and can in particular be  
brought into a respectively required spatial shape by bending.
4.     An implant in accordance with any one of the preceding claims,  
20     characterised in that the outrigger (15) can be cut to the respectively  
required shape and size.
5.     An implant in accordance with any one of the preceding claims,  
characterised in that the outrigger (15) has a plurality of passages  
25     for the reception of fastening elements (19), in particular of bone  
screws.

6. An implant in accordance with any one of the preceding claims, characterised in that the outrigger (15) is formed as a perforated plate.
- 5 7. An implant in accordance with any one of the preceding claims, characterised in that the outrigger (15) is made in mesh-like or grid-like shape.
- 10 8. An implant in accordance with any one of the preceding claims, characterised in that the outrigger (15) includes a plurality of ring sections (23) connected to one another directly or by webs (21) and each bounding a passage.
- 15 9. An implant in accordance with any one of the preceding claims, characterised in that the outrigger (15) is made in one piece with the connection element (17).
- 20 10. An implant in accordance with any one of the preceding claims, characterised in that the outrigger (15) in particular has eyelet-like or ring-like fastening sections (25) for the coupling to the connection element (17).
- 25 11. An implant in accordance with any one of the preceding claims, characterised in that the spatial offset between the main plate (13) and the outrigger (15) can be individually set by the connection element (17).

12. An implant in accordance with any one of the preceding claims, characterised in that the connection element (17) can be fixed at different positions to the main plate (13) and/or to the outrigger (15).
- 5 13. An implant in accordance with any one of the preceding claims, characterised in that the main plate (13) has at least one passage (27) for the guiding through of the connection element (17).
- 10 14. An implant in accordance with claim 13, characterised in that the passage (27) extends substantially parallel to the plane defined by the main plate (13).
- 15 15. An implant in accordance with any one of the preceding claims, characterised in that the connection element (17) has an elongate shape.
16. An implant in accordance with any one of the preceding claims, characterised in that the connection element (17) is bendable.
- 20 17. An implant in accordance with any one of the preceding claims, characterised in that the connection element (17) is a wire or a thread.
- 25 18. An implant in accordance with any one of the preceding claims, characterised in that the connection element (17) can be coupled to the main plate (13) and/or to the outrigger (15) by tying, hooking and or latching.

19. An implant in accordance with any one of the preceding claims,  
characterised in that at least two connection elements (17) respec-  
tively led through at least one passage (27) of the main plate (13)  
can be connected to one another at the side of the main plate (13)  
5 remote from the outrigger (15), in particular by knotting or twisting  
their free ends together.
20. An implant in accordance with any one of the preceding claims,  
characterised in that the outrigger (15) and/or the connection ele-  
10 ment (17) is/are made of metal, e.g. titanium, or of plastic.
21. An implant in accordance with any one of the preceding claims,  
characterised in that the main plate (13) and/or the outrigger (15)  
has/have at least one hook-like or claw-like continuation (29).  
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22. An implant in accordance with any one of the preceding claims,  
characterised in that different implant configurations of the main  
plate (13) and of the outrigger (15) connected to the main plate (13)  
can be established which are symmetrical with respect to the main  
20 plate (13) and in particular with respect to a longitudinal axis of the  
main plate (13).
23. An implant in accordance with any one of the preceding claims,  
characterised in that the outrigger (15) and the connection element  
25 (17) are made separately and are connected so firmly to one another  
that the outrigger (15) and the connection element (17) can be han-  
dled as one unit during an operation.

24. An implant in accordance with claim 23, characterised in that the outrigger (15) and the connection element (17) are unreleasably connected to one another, in particular by welding.
- 5 25. An implant in accordance with any one of the preceding claims, characterized in that the main plate (13) and the outrigger (15) are connected to one another at one side via the connection element (17).
- 10 26. An implant in accordance with any one of the preceding claims, characterized in that the outrigger (15) is made in plate shape and has a smaller thickness than the main plate (13), with in particular the thickness of the outrigger (15) amounting to less than half the thickness of the main plate (13).
- 15 27. An implant in accordance with any one of the preceding claims, characterized in that the outrigger (15) can be deformed without tools during an operation.
- 20 28. An implant in accordance with any one of the preceding claims, characterized in that the outrigger (15) has a smaller base area than the main plate (13).
- 25 29. An implant in accordance with any one of the preceding claims, characterized in that the outrigger (15) has a base shape sufficiently large for all common fractures of a certain bone and can be cut to the required shape and size for matching to a respective bone fracture to be treated.

30. An implant in accordance with any one of the preceding claims, characterized in that the outrigger (15) is provided with at least five passages to receive fastening elements (19), in particular bone screws.
31. An implant in accordance with any one of the preceding claims, characterized in that the outrigger consists of a bioabsorbable material, in particular of a polymer.
32. An implant in accordance with claim 31, characterised in that the bioabsorbable material is plastically deformable at temperatures between 50 and 90°C, in particular after a bath in an appropriately warm salt solution.
33. An implant system for the treatment of bone fractures, in particular of proximal humerus fractures, having at least one main plate (13) fixable to the bone (11,) at least one outrigger (15) and a set of flexible connection elements (17) via which the outrigger (15) can be connected to the main plate (13) such that the outrigger (15) can be fixed to the bone (11) spatially offset to the main plate (13), with the connection elements (17) being prefabricated ready for use and differing from one another with respect to shape, size and/or length.
34. An implant system in accordance with claim 33, characterised in that at least one of the connection elements (17) has a U shape and at least one respective pair of passages (27, 139), in particular provided in the form of bores, is made for a connection element (17)

both in the outrigger (15) and in the main plate (13) and their spacing corresponds to that of the U limbs of the connection element (17).